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Publication date:
2012

Document Version
Publisher's PDF, also known as Version of record

Link back to DTU Orbit

Citation (APA):
Horn, A. F., Nielsen, N. S., & Jacobsen, C. (2012). *Individual whey protein components influence lipid oxidation dependent on pH*. Poster session presented at 103rd AOCS Annual Meeting & Expo, Long Beach, CA, United States.

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Conference abstract (Poster presentation)
103rd AOCS Annual Meeting & Expo, April 29-May 2, 2012, Long Beach, California, USA

Individual whey protein components influence lipid oxidation dependent on pH

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In emulsions, lipid oxidation is expected to be initiated at the oil-water interface. The properties of the emulsifier used and the composition at the interface is therefore expected to be of great importance for the resulting oxidation. Previous studies have shown that individual whey protein components (α-lactalbumin and β-lactoglobulin) adsorb differently to the interface depending on pH. In addition, differences has been shown to exists between the oxidative stability provided by α-lactalbumin and β-lactoglobulin. The hypothesis is that pH influences the oxidative stability of emulsions by affecting the preferential adsorption of whey protein components at the interface.

The aim of the study was to compare lipid oxidation in 10% fish oil-in-water emulsions prepared with 1% whey protein having either a high concentration of α-lactalbumin, a high concentration of β-lactoglobulin or equal amounts of the two. Emulsions were prepared at pH4 and pH7. Emulsions were characterized by their droplet sizes, viscosities, and contents of proteins in the water phase. Lipid oxidation was assessed by PV and secondary volatile oxidation products. Results showed that pH greatly influenced the oxidative stability of emulsions. At high pH β-lactoglobulin emulsions were more stable than α-lactalbumin emulsions, whereas at low pH the opposite was the case.